

Evaluating Speed Limit Policy Impacts in Michigan: Summary of Research Results

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Introduction

- Current Speed Limit Legislation in Michigan
 - 600 miles of Rural Freeways to 75 mph
 - Truck/bus limits 10 mph below auto limit
 - 900 miles of Trunklines to 60 or 65 mph
 - Other roads remain at 55 mph (general limit)
 - Limits below 55 based on access points or engineering studies
- MDOT speed limit policy research project
 - Initial Scope (02/13): Truck/bus differential speed limit
 - Scope Increase (11/13): Freeway speed limits
 - Scope Increase (07/14): Non-freeway speed limits
 - Project concluded summer 2015

Nationwide Policy Debate

Here's why Ohio lawmakers scrapped plans for 75-mph speed limits, new left-lane restrictions

Utah set to bump speed freeways to 70 mph

Utah lawmakers are considering raising the speed limit on its freeways from 65 to 70 mph. The move is part of a larger effort to improve traffic flow and reduce congestion on the state's major roads.

Recent Policy Changes Nationwide

State	Type of Roadway	Old Limit	New Limit	Effective Date
Alaska	Select Rural Freeways	70	75	July 2011
Alabama	Rural Freeways	70	75	July 2011
Arizona	Interstate	55	70/65	February 2012
Arkansas	Select Rural Highway	55	60/65	June 2012
California	Rural Freeways/Interstate	75/80	80/85	October 2012
Colorado	Select Rural Highway	70/65	75/65	April 2013
Connecticut	Select Rural Freeway	65	70	July 2013
Florida	Select Rural Freeway	65	70	September 2013
Georgia	State Highways	55	65	November 2013
Hawaii	Select Interstates	55	60	November 2013
Idaho	Select Interstates	55/60	70	January 2014
Illinois	Select Interstates	55	60	January 2014
Indiana	Rural Freeways	65	70	January 2014
Iowa	Select Interstates	55/65	60/70	May 2014
Kansas	Select Interstates	75	80	July 2014
Kentucky	Select Interstates	75	80	August 2014
Louisiana	Select Interstates	75	80	April 2015
Maine	Rural Interstates, Select Freys	65	70	June 2015
Maryland	Select Interstates	65	70	September 2015
Massachusetts	Rural Interstates	75	80	October 2015
Michigan	Select Freeways	70	75	October 2015
Minnesota	Select Rural Highways	55	65	October 2015
Mississippi	Select Freeways	70/80	75/85	February 2016
Missouri	Select Rural Highways	65/70	70/75	March 2016

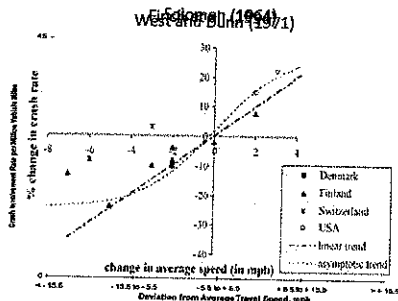
Recent Policy Changes - Nationwide Findings

- Increases have generally occurred on select segments (i.e., not system-wide)
- Feasibility determined based on engineering studies, evidence, and data
 - 85th percentile speeds
 - Realistic, reasonable, and appropriate speed limits
- Speeds typically increase by 1-2 mph per 5 mph speed limit increase (Iowa, Louisiana)
- Too soon for safety analysis
- Unknown economic impacts

Historical Perspective - Impacts of Policy on Safety

- Safety impacts of important Federal actions
 - 1974 - 1987
 - 55 mph maximum speed limit on all U.S. roadways
 - Traffic fatalities decreased by ~7,500 annually
 - 1987 - 1995
 - 65 mph allowed on rural interstates
 - Traffic fatalities increased by 29 percent
 - 1995 - present
 - Maximum speed limits controlled by states
 - More than 12,500 total additional fatalities (through 2005)

Historical Perspective - Speed vs. Crash Risk

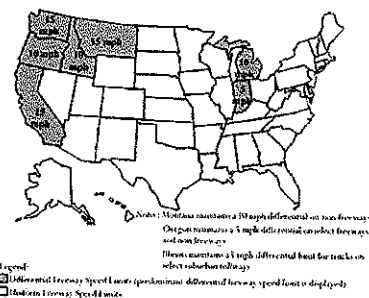


Freeways

Maximum Freeway Speed Limits (2016)



Truck/Bus Differential Speed Limits (2016)



Effects of Speed Limit Policy on Fatal Crashes Nationwide (1999 - 2011)

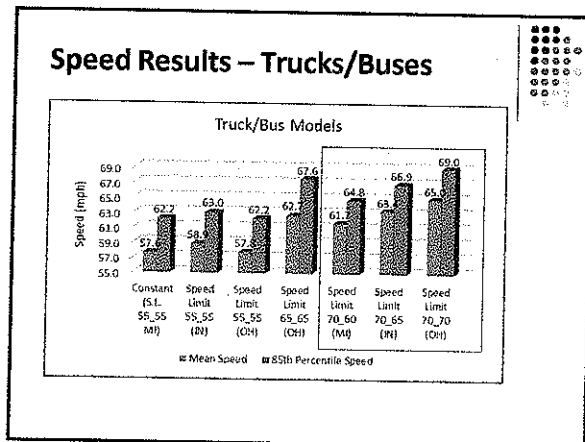
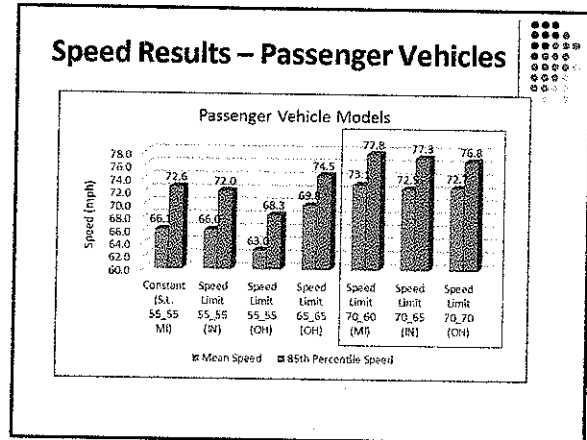
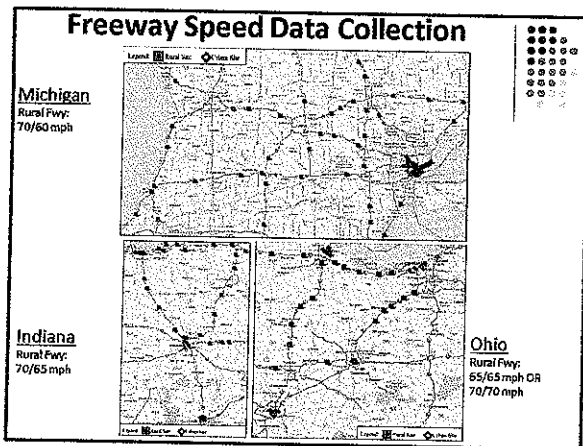
State Speed Limit Policy	Average Change from Baseline for Total Fatal Crashes	Average Change from Baseline for Truck or Bus-Involved Fatal Crashes
60-65 mph maximum speed limit	Baseline	Baseline
70 mph maximum speed limit	+31.0%	+17.1%
75+ mph maximum speed limit	+54.0%	+48.3%
Uniform speed limit	Baseline	Baseline
Differential speed limit	Not Significant	-20.5%

The following variables were controlled in the analysis:
 VMT, Seat Belt Use Laws, Population, Annual Mean Temperature

Effects of Recent Speed Limit Increases on Urban Freeways in Michigan

Segment Type	Change in Total Crash Rate after Increase	Change in Injury Crash Rate after Increase
Control Segments (70 → 70)	-10.4%	-3.0%
Segments with Speed Limit Increase (55 → 65 or 70)	+13.9%	+11.1%

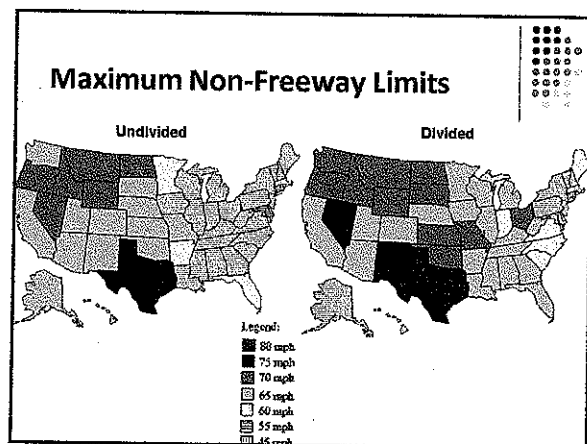
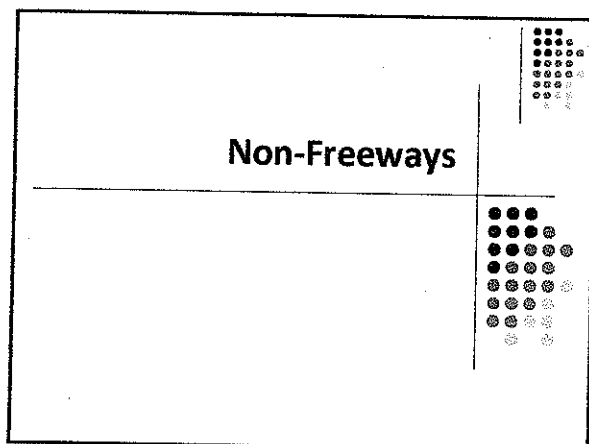
- Included portions of: US-127-Lansing; I-496-Lansing; I-196-Grand Rapids; US-131-Grand Rapids; M-14-Ann Arbor; I-94-Jackson; M-20/US-10-Molland; I-75-Southwest Detroit
- Controlled Before-and-After Study
- Crash Data for 2005-2008 (before) and 2011-2012 (after)

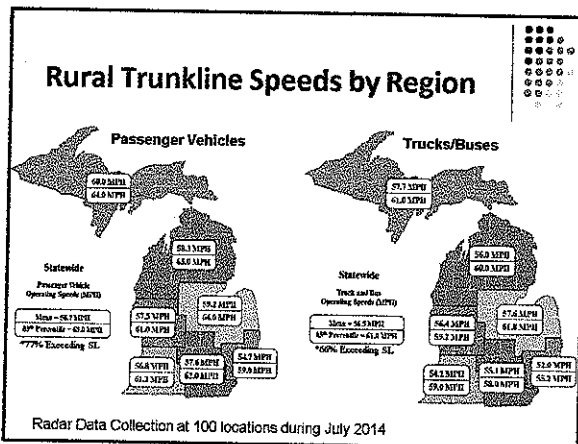


Benefit/Cost Analysis – Freeways (Systemwide Analysis)

Current Speed Limit	Proposed Speed Limit	Benefit/ Cost
70/60 mph	70/65 mph	0.75
70/60 mph	70/70 mph	0.67
70/60 mph	75/70 mph	0.65
70/60 mph	80/70 mph	0.62
55/55 mph	70/70 mph	0.27

Considered costs and benefits related to:
 Infrastructure upgrades
 Travel time and fuel consumption
 Traffic crashes





User Benefits and Costs – 55 mph to 65 mph

- Speeds estimated to increase by 3.4 mph
 - Travel time decreases by 5.5 - 5.7 %
 - Fuel consumption increases by 4.6 - 5.0 %
- Value-of-time savings outweigh fuel costs by:
 - 1.06 for heavy trucks (\$0.0019/mile)
 - 2.98 for passenger vehicles (\$0.0113/mile)
- Increasing the speed limit to 65 mph is expected to increase the total crash rate by 3.3% AND shift the crash severity towards more severe injuries

Benefit/Cost Analysis – Non-Freeway Scenarios

65 mph Trunkline Speed Limit Implementation Scenario	B/C
Scenario 1: Lower Risk; Lower Cost Candidates (M-28 and US-2)	1.23
Scenario 2: Lower Risk; Moderate Cost Candidates	1.12
Scenario 3: All Lower Risk Candidates	0.94
Scenario 4: All MDOT 55 mph Trunklines	0.77

Speed Limit Implementation Recommendations

Implementation Recommendations

- Systemwide application of increased maximum speed limits (freeways or non-freeways) is not desirable from a safety or economic standpoint
- Identify "Lower Risk/Lower Cost" candidate segments for further consideration
- Perform project-level engineering, operations, safety, and infrastructure cost assessment prior to final segment selection
 - Can't ignore federal design standards

Selection of Candidates

- For freeways, candidate locations may include:
 - High 85th percentile speed/low speed variance
 - Low crash and injury rates
 - Favorable roadway geometry (high design speeds)
 - Uncongested and with low truck volumes
 - Low interchange density
- For non-freeways, candidate locations may include:
 - Low crash and injury rates
 - Favorable roadway geometry (high design speeds)
 - Few characteristics that pose safety risk (curves/hills, driveways, schools, intersections, SRZs, NPZs)